



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/597,221

07/17/2006

Ido Milstein

35507

7903

67801

7590

11/09/2009

MARTIN D. MOYNIHAN d/b/a PRTSI, INC.

P.O. BOX 16446

ARLINGTON, VA 22215

EXAMINER

AMIN, BHAVESH V

ART UNIT

PAPER NUMBER

3664

MAIL DATE

DELIVERY MODE

11/09/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/597,221	<b>Applicant(s)</b> MILSTEIN ET AL.	
	<b>Examiner</b> BHAVESH V. AMIN	<b>Art Unit</b> 3664	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 17 July 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1 - 33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 - 33 is/are rejected.
- 7) ☒ Claim(s) 13, 26 & 27 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 July 2009 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 19, 21 – 24 & 31 – 33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Where applicant in claims 19 describes “priori grid” it is unclear as to what this is and hence the meets and bounds of the claim are indefinite and the claim will not be further treated on the merits.

Regarding claim 21 where it is described by applicant to have “neighbors of a point” and “a certain distance or at a certain radius,” it is not clear as to what these encompass and hence the claims will not be further treated on the merits.

Regarding claim 22 where it is described by applicant to have “gradient decent method. It is unclear as to what his is and what the meets and bounds of the claimed limitation are. Thus this claim will no longer be treated under the merits.

Regarding claims 23 – 24, where it is disclosed by applicant to have, “intentionally underestimated,” and “intentionally overestimated,” it is unclear as to what these terms encompass and thus make the claim indefinite due to the meets and bounds of the claim being unclear. Hence these claims will no longer be treated on the merits.

Regarding claim 31 where it is claimed by applicant, "wherein (c) is applied less often than (b)." This limitation is indefinite and the meets and bounds of this limitation can not be ascertained from the specification and hence will not be further examined.

Regarding claim 32 where it is claimed by applicant, "wherein (c) causes delayed evaluation of less promising points." This limitation is indefinite and the meets and bounds of this limitation can not be ascertained from the specification and hence will not be further examined.

Regarding claim 33, where applicant claims, "wherein said delayed evaluation causes a lack of evaluation of at least 40% of points on a grid including said plurality of points." As for claim 32 above, it is unclear to what "delayed evaluation" comprises; thus the meets and bounds of the limitation can not be ascertained. Hence this limitation will not be examined on the merits.

***Claim Rejections - 35 USC § 101***

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 35 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Regarding claim 35, the claimed process (a) does not result in a physical transformation or (b) must be limited to a practical application, which produces a useful, tangible, and concrete result. The claimed process comprises nothing more than collecting and estimating data and does not include a practical application of the data. There is no step that includes applying that information to produce any kind of real world

Art Unit: 3664

result. For process to be statutory, a computer and the descriptive material claimed must act to define a structural and functional interrelationship between the “modeling” steps and the claimed elements of a computer such that a tangible result is realized and therefore useful. The claim does not appear to use any of the data manipulated by the claimed method; therefore, the claim is not statutory process.

Other claims are also rejected based on their dependency of the defected parent claim.

Regarding claim 1, the claim is not directed to patent-eligible subject matter. *In re Bilski*, 545 F.3d 943, 88 USPQ2d 1385 (Fed. Cir. 2008). According to Supreme Court precedent and recent Federal Circuit decisions, in order to be statutory under 35 USC 101 the process must (1) be tied to a particular machine or apparatus, or (2) transforms a particular article to a different state or thing (i.e. “machine-or transformation test”). If neither of these requirements is met by the claim, the method is not a patent eligible process under § 101 and is rejected as being directed toward non-statutory subject matter. This is such a case here since the claimed process consisting solely of mathematical operation that does not manipulate appropriate subject matter and thus cannot constitute a statutory process. There is an insufficient structural and functional interrelationship between the process and a particular machine or apparatus (i.e. there is no machine explicitly recited or inherently required). Therefore, the claim is not statutory process.

#### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 3664

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claim 1 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over DeGraaf US Patent 5,878,368.

Regarding claim 1 where it is disclosed by DeGraaf to have a method for finding a route based on cost as shown in Figure 4. This is read upon by applicant's claim to as indicated below:

“A method of finding a path from a start point to a target point, in multi-dimensional space, comprising: (a) determining a plurality of points in a physical space, including a start point and a target point [Fig 2 (boxes 157 & 158) & Fig 4]; (b) computing, using a cost function, for said points an accumulated path cost from the start point to a point; representing a minimal cost path from the start point to the point with respect to an optimization criteria [Fig 4 and column 3 lines 1 – 13]; (c) computing for at least some of said points an estimated-cost-to-target from a point to the target point [column 6 lines 20 – 45]; and (d) after computing said costs, determining at least one of a minimal path or a minimal path cost of a path from the start point to the target point in the physical space, wherein the determination is based on said accumulated path costs, and is substantially minimal with respect to the optimization criteria [fig 4 and column 6 lines 45 – 67 & column 7 lines 1 – 10].”

Regarding claim 3 where it is disclosed by DeGraaf to determine and present the user with the lowest cost path as described in column 6 lines 45 - 64. This is read upon by applicant's claim to, “wherein the accumulated path cost at the target point

Art Unit: 3664

approximates a minimal accumulated path cost of a path from the start point to the target point in the physical space.”

Regarding claim 4 where it is disclosed by DeGraaf in column 6 lines 22 – 45 to have their system determine the path by using segment/nodes to determine the most cost effective path. This is read upon by applicant’s claim to, “wherein the minimal path determined is made of line segments and each line segment connects two of said points.”

Regarding claim 5 where it is disclosed by DeGraaf to have their system determine the most cost effective path and also considers other paths to determine the most efficient path as described in column 6 lines 20 - 67. It is furthermore shown by DeGraaf to have the system determine many routes and hence also compares all of the routes from one another and hence finds the one with the lowest cost. This is read upon by applicant’s claim to, “wherein the minimal path cost has a lower or equal cost than any zigzag path from the start point to the target point, wherein the zigzag path connects a plurality of said points, only by straight line segments.”

Regarding claim 6 where it is disclosed by DeGraaf in Figure 4 boxes 202 & 204 where it describes the distance or time of the route, hence the route would have to be pretty short and smooth to meet one of the above criterion. This is read upon by applicant’s claim to, “wherein the minimal path determined is a continuous smooth line.”

Regarding claim 7, where it is disclosed by DeGraaf to have a system that can update congestion along the route and hence reroute the vehicle to minimize the cost function, as is described in column 2 lines 25 - 35. This is read upon by applicant’s

Art Unit: 3664

claim to, “comprising repeatedly updating the accumulated path costs until a stopping criteria is satisfied.”

Regarding claim 8 where it is disclosed by DeGraaf to have a system that can determine different routes based on the users preferences and cost of the route and change them as described in column 2 line s1 – 15. This is read upon by applicant’s claim to, “comprising selecting additional points based on said computed costs.”

Regarding claim 9 where it is disclosed by DeGraaf to have their system determine the cost of the segments which intern means two points of each segment and hence reads upon applicant’s claim to, “the accumulated path cost of a point is a function of a local cost of the point and an accumulated path cost of at least one neighbor point of the point.” This is described in DeGraaf in column 6 lines 22 – 64.

Regarding claim 14 where DeGraaf shows in figure 4 box 202 how their system can determine the travel path with the shortest time hence is read upon by applicant’s claim to, “wherein computing said accumulated path cost is carried out using cost calculations suitable for a fast marching method.”

Regarding claims 15 & 16 where it is disclosed by DeGraaf in column 5 lines 60 – 65 describes how the navigation device displays the directions turn by turn hence show a grid map. Hence it would have been obvious to have the device if not inherent to be able to show an “irregular” grid as well if it can show a regular grid. It is believed that it would have been capable by one of ordinary skill in the art at the time of invention to use substitution resulting in predictable results of the exchange of grids for displaying information.



Regarding claim 17 & 18 where it is disclosed by DeGraaf to have their system determine the cost of the route step by step from start point to destination point using segments which consist of two points. This is disclosed in Fig 2, furthermore it is disclosed by DeGraaf in figure 4 to have the system determine the cost between two points e.g., the start point and destination point and find the most cost effective route. This is read upon by applicant's claims to, "wherein said computing using a cost function comprises computing the cost function for grid points in a particular order," and "wherein neighbors of a point are one or more adjacent grid points to the point."

Regarding claim 29 where this has similar limitations as claim 7 and thus is rejected for the same reasons as stated for claim 7 above.

Regarding claim 30 where this has similar limitations as claim 7 above and thus is rejected for the same reasons as stated for claim 7 above.

Regarding claim 28 where it is disclosed by DeGraaf to have the points be subjected to both the shortest distance and quickest time criterion. Thus it would have been able to use different points based on their relationship to distance and time. Hence if it is not found obvious that DeGraaf discloses this then it would have been obvious to one of ordinary skill in the art at the time of invention to have efficient determination of the shortest/quickest route and compare the two as these points may not be the same.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 3664

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 2, 10, 12, 20 & 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeGraaf in further view of Schneider, Jr. US Patent 5,394,325 (hereafter referenced as Schneider).

Regarding claim 2 where all the limitations of claim 1 are disclosed by DeGraaf, whom does not specifically disclose the further limitation of, “determining a plurality of points comprises generating a discrete model of said physical space.” This is disclosed by Schneider in column 6 lines 23 – 43, where they disclose using a modeling for showing the traveling through time, hence discrete space. Thus it would have been obvious to one of ordinary skill at the time of invention to modify DeGraaf by Schneider to efficiently and accurately determine the travel time between points.

Regarding claim 10 where all the limitations of claim 1 are disclosed by DeGraaf, whom does not specifically disclose the further limitation of, “wherein computing said accumulated path cost comprises solving an Eikonal equation.” This is disclosed by Schneider in column 1 lines 59 – 68, where they describe the use of Eikonal equation. Thus it would have been obvious to one of ordinary skill in the art at the time of invention to modify DeGraaf by Schneider to allow for an efficient and accurate process.

Regarding claim 11 where all the limitations of claim 10 are disclosed by DeGraaf and Schneider, where Schneider further discloses the limitation of, “solving comprises employing a finite-difference approximation to an Eikonal equation.” This is disclosed by Schneider in summary of the invention where they describe using finite difference

Art Unit: 3664

equations column 4 lines 20 – 25. Hence it would have been obvious to one of ordinary skill in the art at the time of invention to modify DeGraaf by Schneider to enable fast and accurate solutions to problems.

Regarding claim 12 where all the limitations of claim 10 are disclosed by DeGraaf and Schneider, where it is further disclosed by Schneider to have the use of Eikonal equations. Thus it would have been obvious to one of ordinary skill in the art at the time of invention to modify DeGraaf by Schneider to use limits in equations to reduce the time for computation and reduce the error rate and increase efficiency.

Regarding claim 20 where all the limitations of claim 1 are disclosed by DeGraaf, who does not specifically disclose the further limitation of, “the points are arranged as a graph.” This is disclosed by Schneider in Figs 5A-B and thus it would have been obvious to one of ordinary skill in the art at the time of invention to modify DeGraaf by Schneider show the most cost efficient path between points.

Regarding claim 25 where all the limitations of claim 1 are disclosed by DeGraaf who does not specifically disclose the limitation of, “estimated cost to target is based on a Euclidian distance to said target.” This is disclosed by Schneider where it is disclosed by them to have a estimation equation “Runge kutta” method as described in column 17 lines 16 – 31, to produce smooth lines and thus it would have been obvious to one of ordinary skill in the art at the time of invention to modify DeGraaf by Schneider using simple substitution of well known equation to produce a predictable result. (MPEP 2143).

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BHAVESH V. AMIN whose telephone number is (571)270-3255. The examiner can normally be reached on M - T, Friday off, 7:30am to 6:00pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Khoi Tran can be reached on 571-272-6919. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/B. V. A./  
Examiner, Art Unit 3664  
/KHOI TRAN/  
Supervisory Patent Examiner, Art Unit 3664